Patent claims

1. Method for the determination of characteristic layer parameter by irradiation of light on to a layer structure, determination of the temperature of the layer by means of at least one emissivity-corrected pyrometer, spectral-optical measurement of the reflected light, determination of the characteristic layer parameters,

characterised in

that the wobbling and/or rotating of the sample to be measured is compensated

and/or

that the pyrometer optical path and the optical path of the spectral-optical system are guided separately of each other

and/or

that a separation of the radiation signal for the temperature measurement and the radiation signal for the spectral-optical measurement is implemented by blanking of the irradiated light.

2. Method according to claim 1,

characterised in

that the compensation of the wobbling and/or the rotating of the sample to be measured is implemented by a spherical mirror, where the sample is located in the centre of the curvature of the spherical mirror.

3. Method according to claim 1,

characterised in

that the compensation of the wobbling and/or the rotating of the sample to be measured is implemented by a lens, a beam splitter and an aperture.

4. Method according to claim 1,

characterised in,

that a separation of the radiation signal for the temperature measurement and the radiation signal for the spectral-optical measurement is implemented by synchronised blanking of the irradiated light.

5. Method according to claim 1,

characterised in,

that the blanking is implemented by means of a shutter.

6. Method according to at least one of the claims 1, 5 or 6,

characterised in,

that the synchronisation of the blanking takes place with respect to the rotation of a sample mounted on the sample carrier.

7. Method according to at least one of the claims 1 to 6,

characterised in,

that additionally a measurement of the radial temperature profile of the sample carrier takes place.

8. Method according to at least on of the claims 1 to 7,

characterised in,

that a separation of the pyrometer optical path and the optical path of the spectral-optical system is caused by a beam dividing polarizing prism in case of reflectance anisotropy spectroscopy.

9. Method according to claim 1,

characterised in,

that the pyrometer optical path is separated from the optical path of the spectral-optical measurement, where the angle of detection of the pyrometer with respect to the sample perpendicular is identically equal to the angle of incidence of the spectral-optical measurement with respect to the sample perpendicular .

10. Method according to at least one of the claims 1 to 9,

characterised in,

that the calculation of the effective emissivity $<\varepsilon>$ of a sample is carried out according to the formula

$$<\varepsilon> = (1-R_P) * (1+R_{ATS}*R_P) = \varepsilon_P * (1+ R_{ATS} *R_P)$$

where R_P is the reflectance of the sample, R_{ATS} the reflectance of the anti-wobbling-mirror and ε_P the emissivity of an absorbing sample without anti-wobbling-optics.

11. Method according to at least one of the claims 1 to 9,

characterised in,

that the calculation of the effective emissivity $<\varepsilon>$ of a transparent sample and transmissive measurement is carried out according to the formula:

$$<\varepsilon> = \varepsilon_{PT} * T_P * (1+R_{ATS}*R_P + R_{ATS} *T_P^2 * R_{PT})$$

where T_P is the transmission coefficient of the sample, R_P is the reflectance of the sample, R_{ATS} the reflectance of the anti-wobbling-mirror, R_{PT} the reflectance of the sample holder and ε_{PT} the emissivity of the sample carrier .

12. Method according to at least one of the claims 1 to 9,

characterised in,

that the spectral-optical measurement is carried out using only one wavelength.

13. Apparatus for the determination of characteristic layer parameters comprising a spectral-optical system, at least one emissivity-corrected pyrometer and analysis means ,

characterised by

means for compensation of the wobbling and/or the rotating of the sample

and/or

means for blanking of the irradiated light.

14. Apparatus according to claim 13,

characterised in,

that the means for the blanking of the irradiated light is a shutter.

15. Apparatus according to claim 13 or 14,

characterised in,

that the means for the compensation of the wobbling and/or the rotating of the sample comprise a spherical mirror, where the sample is located in the centre of the curvature of the spherical mirror.

16. Apparatus according to claim 13 or 14,

characterised in,

that the means for the compensation of the wobbling and/or the rotating of the sample comprises a lens, a beam splitter and an aperture.

17. Apparatus according to at least one of the claims 13 to 16,

characterised in,

that the apparatus comprises several pyrometers arranged in different distances to the centre of a rotatable sample carrier.

18. Apparatus according to at least one of the claims 13 to 17,

characterised in,

that the apparatus additionally comprises at least one beam splitter and/or at least one beam dividing polarizing prism.